

alleged by plaintiff(s). Dr. Oury may testify generally regarding the latency periods associated with asbestos-related conditions alleged by plaintiff(s). Dr. Oury may testify regarding the evidence that tremolite contamination (or other exposure to amphibole asbestos) explains the incidence of certain asbestos-related disease among individuals exposed to chrysotile asbestos.

Dr. Oury may also testify regarding the diagnosis of any purportedly asbestos-related disease or condition alleged by the plaintiff(s) and respond to testimony by any of plaintiff's experts regarding the same. Dr. Oury may also testify regarding other probable or possible causes of any disease or condition alleged by the plaintiff(s), including but not limited to, smoking where relevant.

29. Jack E. Petersen, Ph.D., C.I.H., P.E.  
Alpine, CA

Dr. Petersen is a certified industrial hygienist. He may testify on industrial hygiene principles and standards, including but not limited to OSHA and ACGIH standards, the evolution and history of threshold limit values and permissible exposure limits, the relative toxicity of different types of asbestos, the relative friability of different asbestos-containing products, their propensity to cause disease, and related issues. He may testify concerning the nature, extent, and etiology of various asbestos-related diseases. Dr. Petersen may testify regarding his knowledge of various types of products, their uses, and the potential for exposure to airborne asbestos fibers experienced by plaintiff(s) in allegedly working directly with those products or in the vicinity of their use. Dr. Petersen may also testify as to the industrial hygiene state of the art regarding asbestos-related disease.

30. Dr. Frederick Pooley  
Cardiff, UK

Dr. Pooley is a mineralogist. Dr. Pooley may testify that "asbestos" is a generic term for a group of naturally occurring fibrous minerals. Dr. Pooley may testify that there are two major groups of asbestos, serpentine and amphiboles, which have different physical forms and clearance rates after deposition in human lungs. Dr. Pooley may testify that the serpentine group contains one form of asbestos, chrysotile, and that the amphibole group contains several forms of asbestos, including crocidolite, amosite, tremolite, actinolite, and anthophyllite. Dr. Pooley may identify those types of fibers that have been shown to create an increased risk for malignant mesothelioma and may testify as to the physical and chemical characteristics of fibers that have been shown to create an increased risk of malignant mesothelioma.

Dr. Pooley may testify as to the methods for analyzing materials such as bulk samples and/or specimens of human lung to determine whether asbestos fibers are present and what types of asbestos fibers are present. Dr. Pooley may testify regarding analyses that he has performed to determine whether chrysotile asbestos from certain geographical areas is contaminated by tremolite and to determine the types of asbestos to which individuals with potentially asbestos-related diseases have been exposed. Dr. Pooley may testify regarding his conclusions from those analyses regarding the types of asbestos fibers that are responsible for the conditions alleged by plaintiff(s).

31. **James Rasmuson, Ph.D., CIH, DABT**  
Wheat Ridge, CO

Dr. Rasmuson is a certified industrial hygienist and toxicologist. Dr. Rasmuson may testify about industrial hygiene and threshold limit values, OSHA PELs, exposure limits, methodologies for identifying and measuring asbestos in air, product testing, emissions, development of knowledge regarding asbestos exposure, product warnings, and/or dust counting equipment and techniques. Dr. Rasmuson may discuss the relationship between scientific knowledge and the development of public policy and standards relating to asbestos exposure, and all aspects of government regulation of asbestos release and exposure. Dr. Rasmuson may also testify about the dose-response relationship between exposure to asbestos and disease, and other related matters.

Dr. Rasmuson may testify about the principles of industrial hygiene and the factors that are important to industrial hygiene studies. He may testify as to the manner in which experts can use industrial hygiene data and how the data should be interpreted in specific cases. Dr. Rasmuson may testify as to the manner in which industrial hygiene data should be considered in evaluating exposures.

Dr. Rasmuson may testify regarding the source, amount, and type of asbestos fibers to which plaintiff(s) may have been exposed based on review of available workplace documents, plaintiff's employment records and testimony, co-worker testimony, industrial hygiene surveys of work sites and literature and studies describing exposures associated with different work practices, and/or hypothetical facts presented at the time of trial.

Dr. Rasmuson may testify about asbestos fiber release from products, based on his own knowledge and expertise, as well as published literature and other studies. He may testify that one would not expect any substantial release of asbestos fibers from certain types of products during their normal and expected application, use, and removal. He may testify, based upon his experience and review of the literature and other data, that exposure to certain types of products would not increase the risk of acquiring any asbestos-related disease.

Dr. Rasmuson may also testify as to the ability of various types of fibers to cause disease and the properties of fibers that are believed to be necessary in order to cause disease. Dr. Rasmuson may testify that the literature, including epidemiological data, does not support a causal relationship between exposure to low levels of chrysotile asbestos, and the development of asbestos-related diseases. Dr. Rasmuson may testify that such levels would not be a contributing factor along with other exposures in increasing the risk of disease.

Dr. Rasmuson may also be asked to testify in response to the opinions of plaintiff's experts. Dr. Rasmuson may be provided with copies of the testing data of experts retained by counsel for plaintiff(s), if any, and may be asked to comment on the methods used in the studies as well as the results of the studies, as compared to published studies and data reviewed by Dr. Rasmuson and his own knowledge and experience.

32. Lee Reichman, M.D.  
Tenaflly, NJ

Dr. Reichman may testify as to what and when doctors, mine owners, and manufacturers knew or should have known about the dangers of exposure to asbestos, not only to persons working in mines and manufacturing plants, but also to those coming into contact with the product, such as insulators, pipe fitters, and others working in close proximity to the installation or removal of asbestos-containing materials. Dr. Reichman may be expected to testify as to the available knowledge or understanding of a particular disease entity at a given point in time, as well as the knowledge or understanding of the risks or hazards of being exposed to asbestos in certain occupations or at given levels of exposure.

In addition, Dr. Reichman may testify regarding general medical issues relating to an exposure to asbestos in any individual or in a specific group of tradesmen, such as insulators, pipe fitters, etc.

33. Jon Ritter, M.D.  
St. Louis, MO

With respect to the Plaintiff, Dr. Ritter may testify regarding his review and interpretation of x-ray films, review and interpretation of pulmonary function testing, review and interpretation of medical histories and medical records review, and interpretation of pathological materials, the nature and extent of any impairment or disability of Plaintiff, and the presence of any other diseases or conditions from which the Plaintiff suffered.

Dr. Ritter may also be expected to testify, in general, concerning asbestos-related diseases and the effects of exposure to asbestos upon a person or persons in general, including the epidemiology of asbestos-related diseases.

Furthermore, Dr. Ritter may be expected to testify whether a particular Plaintiff or group of Plaintiffs is at an increased risk of developing cancer, whether a Plaintiff has a reasonable fear of cancer due to his exposure to asbestos, as well as the prognosis of each of these persons. In addition, Dr. Ritter may also testify regarding the consequences of the inhalation of tobacco smoke.

34. Victor Roggli, M.D.  
Durham, NC

Dr. Roggli is a pathologist. Dr. Roggli may be offered as an expert physician, with particular expertise in pathology, in the process of carcinogenesis, as a researcher in the field of asbestos related conditions and their etiology, in the pathologic diagnosis and grading of non-malignant conditions associated with exposure of certain populations to asbestos-containing products and/or materials, and in the epidemiologic and etiologic aspects of certain cancers that are alleged to be causally associated with exposure of certain populations to asbestos containing products and/or materials.

Dr. Roggli may provide testimony concerning the anatomic structure and functioning of

the lung from a pathologic perspective, the defense mechanisms and functioning of the lung in health and otherwise, the responses of the lung to various stimuli, and the role of various components of the respiratory system in the proper functioning of the lung.

Dr. Roggli may testify concerning the circumstances under which exposure to certain forms and types of asbestos may be associated with the incidence of some forms of mesothelioma in some persons, and will testify concerning the results of his own experiences, the medical and scientific literature, and existing epidemiologic studies concerning associations that are alleged to exist epidemiologically between exposure to asbestos in some populations and the mortality and/or incidence of some forms of cancer.

Dr. Roggli may testify as to the general medical aspects of the diagnosis and treatment of asbestos-related disease and the pathological effects of asbestos on the lung. He may also testify as to the relationship of asbestos exposure and the incidence of conditions alleged by the plaintiff(s), including pleural plaques, asbestosis, lung and other cancer and mesothelioma. Dr. Roggli may testify that "asbestos" is a generic term for a group of naturally occurring fibrous minerals. Dr. Roggli may testify that there are two major groups of asbestos, serpentine and amphiboles, which have different physical forms and clearance rates after deposition in human lungs. Dr. Roggli may testify that the serpentine group contains one form of asbestos, chrysotile, and that the amphibole group contains several forms of asbestos, including crocidolite, amosite, tremolite, actinolite, and anthophyllite. Dr. Roggli may testify regarding the differing potential of these various forms of asbestos to cause conditions alleged by the plaintiff(s). Dr. Roggli may testify generally regarding the role that the size, structure and chemical composition of different types of asbestos fibers play in their ability, or lack thereof, to cause conditions alleged by plaintiff(s). Dr. Roggli may testify generally regarding the role of dose in determining whether certain types of asbestos fibers can cause or contribute to conditions alleged by plaintiff(s). Dr. Roggli may testify generally regarding the latency periods associated with asbestos-related conditions alleged by plaintiff(s). Dr. Roggli may testify regarding the evidence that tremolite contamination (or other exposure to amphibole asbestos) explains the incidence of certain asbestos-related disease among individuals exposed to chrysotile asbestos.

Dr. Roggli may also testify as to the specific requirements necessary for an exposure to be considered a substantial contributing factor to disease. Dr. Roggli will testify as to the results of his fiber burden and analysis in this case, if appropriate and sufficient tissue has been made available. Dr. Roggli may also testify regarding the diagnosis of any purportedly asbestos-related disease or condition alleged by the plaintiff(s) and respond to testimony by any of plaintiff's experts regarding the same. Dr. Roggli may also testify regarding other probable or possible causes of any disease or condition alleged by the plaintiff(s), including but not limited to, smoking where relevant. It is expected that Dr. Roggli's testimony will generally respond to the pathologic, scientific and epidemiologic testimony which may be offered by plaintiff's experts, and in that sense his testimony is dependent upon the prior testimony of such experts and cannot be specifically predicted.

In expressing his opinions, Dr. Roggli will rely on his own training, education, experience, research and publications, as well as the published medical and scientific literature that has been available to him over his career and his review of the pathological materials

available in this case.

35. Sidney Shindell, M.D., LLB  
Milwaukee, WI

Dr. Shindell is a physician. He may testify generally about the evolution of asbestos disease; the pathology of asbestos-related diseases including those named as Non-Routine; the state-of-the-art of asbestos-related diseases; and will testify about other areas of pulmonary pathology including, but not limited to, emphysema, carcinomas, and related matters. Dr. Shindell may testify about his personal experience in the development of the history of asbestos related medicine and the medical literature and his impressions of 1964 being a "watershed" as it relates to asbestos disease. Dr. Shindell may testify generally about the pulmonary aspects of asbestos exposure, including matters such as dose response. Dr. Shindell may testify about alleged occupational exposure and whether such exposure could be considered a substantial contributing factor to plaintiff's alleged disease. Dr. Shindell may testify that as exposures to asbestos have diminished since the inception of the OSHA standards, the extent and number of cases of asbestosis have been and are expected to continue to diminish.

Dr. Shindell may testify regarding the differing physical, chemical and biological properties of various types of asbestos fibers, and will explain that chrysotile fibers are incapable of causing, or unlikely to have caused, plaintiff's alleged condition. Dr. Shindell may testify as to the ability of various types of fibers to cause disease and the properties of fibers that are believed to be necessary in order to cause disease. He may testify that chrysotile asbestos fibers are not expected to produce an increase risk of mesothelioma.

Dr. Shindell may provide testimony in the following areas: anatomy and function of the respiratory and circulatory systems and the diagnosis and the treatment of disease affecting such systems; the nature of asbestos and asbestosis; the symptomatology, disease process and diagnosis of asbestos and cancer associated with the respiratory system, peritoneum and peritoneal cavity; the nature and extent of medical and scientific knowledge regarding any association of obstructive pulmonary disease with asbestos fiber exposure; the effect of exposure to substances other than asbestos, such as tobacco, on the development and manifestation of obstructive and restrictive conditions and diseases of the respiratory system and other causes of obstructive and restrictive disease or defects of the respiratory system; methods of diagnosis of various diseases, particularly means of establishing the differential diagnosis of alleged asbestos-related diseases with other non-asbestos-related diseases; incidence of lung cancer among individuals with asbestosis or asbestos exposure without asbestosis, compared with non-asbestotic asbestos workers, non-asbestos exposed workers, and with the general population; the import of any exhibit (including without limitation, corporate documents of defendants) introduced as evidence, or any items prepared for use or used for demonstrative purposes by any witness; cigarette smoking and its effect on the lung and other organs; the relative danger of certain asbestos-containing products; the relationship of cigarette smoking to cancer of the lung and cancers of other sites with reference to epidemiological studies and physiologic effect; differences between impairment and disability; effect of asbestosis, or asbestos exposure without asbestosis, on disability and life expectancy; effect of pleural plaques or other pleural manifestations of asbestos exposure on lung function or life expectancy; the relative



carcinogenicity of chrysotile asbestos relative to the other forms of asbestos.

Dr. Shindell may testify about certain products in that he has reviewed information and studies regarding exposure levels experienced with certain work practices used with asbestos-containing products, and is familiar with the literature concerning low level exposures. Dr. Shindell may testify that the literature does not support a causal relationship between exposure to certain products and the development of an asbestos-related disease.

Dr. Shindell may testify about the principles of epidemiology and what is involved in an epidemiologic study. He may testify that studies of particular groups or occupations of people are not necessarily applicable to other groups or occupations. Dr. Shindell may testify as to the information necessary to determine the risks for a group of people or persons contracting an asbestos-related disease and if it is scientifically possible to attribute a disease to a particular exposure. Dr. Shindell may discuss epidemiological analysis of asbestos and how such analysis may be applied to the facts of a specific individual.

Dr. Shindell may testify that cigarette smoking is the chief cause of lung cancer, that almost all of the lung cancers in America occur in present or ex-smokers, and that one cannot develop lung cancer related to asbestos exposure unless there is underlying asbestosis. Dr. Shindell may testify that the earlier exposures to asbestos are, if sufficient, the principal cause of the disease and not later exposures. Dr. Shindell may testify that in at least 33% of mesotheliomas, asbestos exposure cannot be found.

36. Lee Sider, M.D.  
New York, NY

Dr. Sider is a practicing radiologist and is a B-reader as certified by NIOSH. In general, it is anticipated that Dr. Sider will testify concerning their interpretation of the plaintiff's chest films, the presence of any asbestos-related condition as evidenced on the chest film, as well as the presence of other abnormalities or conditions unrelated to an exposure to asbestos.

37. Robert Spence, M.S., C.I.H.  
Millville, CA

Mr. Spence is a certified industrial hygienist. He may testify concerning the history of industrial hygiene, industrial hygiene methods, and threshold limit values and permissible exposure levels as promulgated by private organizations and government agencies. Mr. Spence may also testify regarding the level of fiber release, if any, from operations involving various asbestos-containing products. Mr. Spence may testify about uses of and work practices concerning these products. Mr. Spence may also testify concerning OSHA and EPA reports, statements, guidelines and regulations concerning various asbestos-containing products.

38. **Frederick Toca**  
Dover, NJ

Dr. Toca is a certified industrial hygienist with a background in evaluating the workplace for potential hazards by analyzing work practices, measuring and evaluating exposures to various substances, and determining, then controlling the nature and extent of health risk in occupational settings. Dr. Toca may testify as to the state of the art with respect to asbestos in the field of industrial hygiene, and the evolution of knowledge in general regarding the effects of asbestos exposure and its control, the development of public policy and standards relating to asbestos exposure, and all aspects of government regulation of asbestos exposure. Dr. Toca may testify about the development of knowledge regarding the dose-response relationship between exposure to asbestos and disease, and other related matters. He may also testify as to the development and utility of methodologies for identifying and measuring asbestos in air, dust and products, and the setting of threshold limit values, the OSHA PELs, and other protective levels for asbestos exposure.

Dr. Toca may testify as to the different types of asbestos fiber, their physical and chemical composition, as well as their potential to cause disease. Dr. Toca may be asked to analyze the specific exposures in this case, as alleged by plaintiff(s) and/or co-workers, and to determine whether the alleged exposures created a significant risk of asbestos-related disease. Dr. Toca may comment upon and/or respond to expert testimony or opinion offered on behalf of plaintiff(s) in this case, including but not limited to testimony, if any, regarding state of the art, the evolution of knowledge of the effects of asbestos exposure, standards and regulations applicable to asbestos exposure, with respect to products and testing done by or on behalf of plaintiff(s).

Dr. Toca may testify regarding asbestos-containing products and the ability, or lack thereof, of such products to release respirable asbestos fibers under various occupational conditions. Dr. Toca may testify regarding the level of asbestos dust and the types of asbestos fibers that plaintiff(s) may have been exposed to based on review of available work place documents, plaintiff's employment records and testimony, co-worker testimony, industrial hygiene surveys of work sites, and/or hypothetical facts presented at the time of trial.

39. **Dr. Charles A. Weaver, III**  
Waco, TX

Dr. Charles A. Weaver, III, is an expert in the areas of human memory and cognition. His research interests include memory, the relationship between confidence and memory, eyewitness memory and the effect of misleading information, "flashbulb memory", and repression and the false memory syndrome. Dr. Weaver earned his undergraduate degree from Baylor University in 1984, and obtained his masters and doctorate degree in Psychology from the University of Colorado, Boulder. Dr. Weaver is a full professor of Psychology and Neuroscience at Baylor University in Waco, Texas, where he has taught since 1989. Dr. Weaver also serves as an associate editor of the Journal of Experimental Psychology: Learning, Memory, and Cognition, and is a member of the Professional and Scientific Advisory Board of the False Memory Syndrome Foundation.

If called to speak to the jury, Dr. Weaver will discuss the nature of memory, recall and retention. He will rely on general principles in the field of psychology and neuroscience and apply them to the factual allegations presented by plaintiff and other fact witnesses. Dr. Weaver will discuss the probability that specific factual information pertaining to a work environment could be retained over a period of decades. He will draw upon his understanding of the physical and biological limitations of memory creation and retention, and the likelihood that after-event stimulus may generate inaccurate or false memories. He will discuss the manner in which "false memories", term used by psychologists and researchers in the field, can be imprinted and how those memories can rise to the level of an actual memory despite being incorrect.

Dr. Weaver will define for the jury in scientific and medical terms human memory, which he describes as a dynamic, creative and reconstructive process. He will discuss memory in terms of "encoding" information, and will describe how memory can be altered by the conditions present when generation or retrieval of memory occurs, for example, due to a leading question presented by an attorney, materials offered to "refresh recollection", or conversations that suggest certain events took place that were known to the individual whose memory is being generated. Dr. Weaver will discuss how memories can be altered by events which take place or information which is learned after the original circumstances. He will relate how the more a memory is retrieved or rehearsed, the greater the person's subjective confidence in the accuracy of the memory, but that increased confidence does not necessarily lead to improved memory accuracy. Dr. Weaver will also discuss his laboratory research and discuss his findings, and the results available in the published literature, that support his opinions.

40. **Drew Van Orden**  
Monroeville, PA

Mr. Van Orden is mineral engineer and a statistician. Mr. Van Orden may be called to testify about the development and use of scientific knowledge and techniques regarding the collection, analysis and measurement of airborne asbestos levels. He may also testify as to the governmental and industrial standards, past and present, for airborne asbestos. Additionally, he may be called to testify about the development and use of the technology to measure airborne levels of fibers, and the standards and methods used for air sampling and sample preparation, including the direct and indirect methods. Mr. Van Orden may also testify about standards governing asbestos and the methodologies for sampling, measuring and analyzing air to determine the presence of particles, and the history and current methodologies for electron microscopy. Mr. Van Orden may testify that, for certain types of products, he would not expect any substantial release of asbestos fibers. He may also comment on and/or respond to expert testimony or opinion offered on behalf of plaintiff(s), including, but not limited to, testimony and/or reports (if any) regarding testing relating to potential asbestos exposure done by or on behalf of plaintiff(s), test methodologies, and analytical methods.

41. **Mark Wick, M.D.**  
St. Louis, MO

Dr. Wick may testify, in general, concerning asbestos-related diseases and the effects of



exposure to asbestos upon a person or persons in general, including the epidemiology of asbestos-related diseases. Furthermore, he may testify whether plaintiff(s) is at an increased risk of developing cancer, whether plaintiff(s) has a reasonable fear of cancer due to exposure to asbestos, as well as the prognosis of each of these persons. In addition, he may also testify regarding the consequences of the inhalation of tobacco smoke.

42. Steven L. Carter  
Lenexa, KS

Mr. Carter currently is the records custodian of THAN. He may testify, based on the corporate records, about the business and history of THAN and/or THCC.

43. Robert Mann  
Independence, MO

Mr. Mann joined THCC as a technical sales representative in 1965 and later became manager of product marketing, general manager and vice-president of THCC's industrial chemicals division. He may testify about the operation of THCC and its sales of asbestos fiber and other products, THCC's relationship with Carey Canadian Mines, and THCC's decision to cease distribution of chrysotile asbestos fiber.

44. Max Mason  
Shawnee Mission, KS

Mr. Mason joined THCC in 1952 as a sales representative and later become branch manager and then manager of THCC's industrial chemicals division. He may testify about THCC's lack of knowledge about the potential dangers of exposure to chrysotile asbestos during the period of his employment; he may also testify about the amount and role of asbestos fiber sales in the context of THCC's business.

45. Clifford Wiksten  
Shawnee Mission, KS

Mr. Wiksten was a warehouse employee of THCC from approximately 1974-77 and served in various other capacities from 1972-74 and 1978-96. He may testify about information and warnings on bags of asbestos fibers during his employment as well as others matters incident to his employment in the warehouse.

**TH AGRICULTURE & NUTRITION, L.L.C.'S EXHIBIT LIST**

Defendant THAN reserves the right to amend or supplement this exhibit list, and, to the extent that the plaintiffs intend to introduce any of these exhibits in its case-in-chief, THAN reserves all objections as to the authenticity, relevancy or admissibility of these exhibits. Further, THAN incorporates by reference any exhibits designated by any other party to this action.

1. Thompson-Hayward news release: "John Sigler Appointed Safety Director."
2. Thompson-Hayward advertisement: "Your time is something we never tamper with."
3. "Chemicals for Industry" from Thompson Hayward Chemical Company. 1941.
4. Thompson-Hayward Bulletin from J. Robinson to all price book holders transmitting information from Carey-Canadian re: Asbestos Grades. March 7, 1961.
5. Thompson-Hayward Bulletin from J. Robinson to all salesmen re: Asbestos fiber product information from Carey-Canadian. March 31, 1961.
6. Carey-Canadian Mines Bulletin No. 127 "Tips on Sale of Floats to Plastics Manufactures." July 31, 1962.
7. Letter from F. Evinger (Carey-Canadian Mines) to R. Cucullu (Thompson-Hayward) re: Sales calls, with attached listing of freight rates. March 4, 1963.
8. "This is Thompson-Hayward," reprinted from The Kansas Citian. July 12, 1966.
9. "Chemicals for Industry" from Thompson-Hayward. 1967.
10. "The First Fifty Years" from Thompson-Hayward. 1967.
11. Letter from N. Hendry, General Sales Manager (Johns-Manville) re: Caution Label for Asbestos; with Deposition of N. Hendry dated 7/30/1980 discussing same [pp. 29-31: First cautions on bags, 1966-1968, notice letter to customers 1968]; Affidavit of M. Baumgardner dated 08/22/2003; and THAN Designation of Deposition of N. Hendry. October 1, 1968; July 30, 1980; August 22, 2003.
12. Letter from B. Bouldin (Thompson-Hayward) to F. Evinger (Carey-Canadian).

November 23, 1968.

13. Letter from H. Plate (Carey-Canadian) to H. Bayne (Thompson-Hayward) re: additional distributor relationship. March 28, 1969.
14. Thompson-Hayward price list for all chemicals carried. October 1970.
15. Memorandum from P. Lonnecker announcing appointment of J. Sigler as Safety Director. April 27, 1971.
16. Order establishing Occupational Health & Safety Administration in Federal Register, Vol. 36, No. 92. May 12, 1971.
17. Occupational Health & Safety Standards (29 CFR 1910) in Federal Register, Vol. 36, No. 105. May 29, 1971.
18. OSHA Standard for Exposure to Asbestos Dust, Part 1518, Federal Register, Vol. 36, No. 234. December 7, 1971.
19. Carey-Canadian Bulletin No. 368 to Distributors, District Customers, and Salesmen, re: Caution notice on asbestos bags, with attached notice. July 27, 1971.
20. OSHA Standard for Exposure to Asbestos Dust (29 CFR 1910) in Federal Register, Vol. 37, No. 7. January 12, 1972.
21. Carey-Canadian Bulletin No. 381 to All U.S. Direct Customers re: Material Safety Data Sheet for Chrysotile Asbestos. May 5, 1972.
22. OSHA Standard for Exposure to Asbestos Dust (29 CFR 1910) in Federal Register, Vol. 37, No. 110. June 7, 1972.
23. EPA NESHAP Standard for Asbestos, Beryllium, and Mercury, in Federal Register, Vol. 38, No. 66. April 6, 1973.
24. Carey-Canadian Newsletter from A. Bagenstose transmitting summary regarding asbestos and health. September 22, 1975.
25. Letter from J. Sztuke (Carey Canadian) to K. Freeman (U.S. Gypsum) re: Transmission of Material Safety Data Sheet for Asbestos Floats. February 16, 1978.
26. Carey-Canadian Bulletin No. 525 from A. Bagenstose to "all industrial managers" re: shipment and packaging requirements for asbestos fiber. May 1, 1979.
27. Thompson-Hayward Industrial Sales Bulletin from B. Mann to "Industrial Sales"

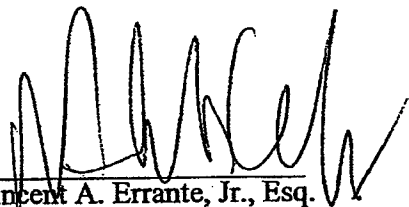
with handwritten note indicating asbestos fiber no longer handled and no longer stocked. June 2, 1980.

28. Certificate attesting to Incorporation of Thompson-Hayward Chemical Company and amendment thereto to change corporate title to Thompson-Hayward Agriculture and Nutrition Company, Inc. June 19, 1981.
29. Carey Canada Inc.'s Responses to Plaintiff's Interrogatories in *Robert Gatewood et al. v. National Gypsum Co., et al.* August 3, 1988.
30. Answer and Objections of Carey Canada Inc.'s Responses to Plaintiff's Interrogatories in *Greenwood S.D. No. 50 v. Carey Canada Inc., et al.*
31. "A Report of the Possible Tremolite Content of Carey-Canadian Chrysotile Asbestos" by Professor F. Pooley, University of Cardiff, Wales, UK. May 6, 2003.

THAN reserves its rights to revise and/or supplement this trial exhibit list.

Dated: New York, New York  
June 26, 2007

By:

  
Vincent A. Errante, Jr., Esq.  
Darger & Errante, LLP  
Attorneys for Defendant  
T-H Agriculture & Nutrition, L.L.C.  
116 E. 27<sup>th</sup> St., 12<sup>th</sup> Floor  
New York, NY 10016  
(212) 452-5300

To: Chris Romanelli, Esq.  
Weitz & Luxenberg, P.C.  
Counsel for Plaintiffs  
180 Maiden Lane  
New York, NY 10038  
(212) 558-5500

All defense counsel

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## Boelter Associates

CONSULTING ENGINEERS AND SCIENTISTS

August 13, 2007

**VIA FAX 312/645-7711**

Mr. Cameron Turner  
Attorney at Law  
Segal McCambridge Singer & Mahoney  
233 S. Wacker Drive  
5500 Sears Tower  
Chicago, IL 60606

Re: In re New York City Asbestos Litigation, New York Asbestos Case  
In re: New York City Asbestos Litigation In-Extremis Trial Group (Francis Bianco)  
(Weil-McLain)

Dear Mr. Turner:

This letter will serve as my report in the referenced matter. I have reviewed the deposition transcripts of Mr. Francis Bianco taken October 30, November 1, November 3, November 8, and November 10, 2006; the video testimony transcript of Mr. Francis Bianco taken November 15, 2006; Plaintiff's Responses to Defendant's Fourth Amended Standard Set of Interrogatories and Request for Production of Documents dated October 17, 2006 with attached; verified complaint dated October 17, 2006; social security records dates ranging from 1954 through 2006; and the reports of Drs. Nathan Rothman dated March 12, 2007, Douglas Pohl dated March 6, 2007 and Donna Ringo, CIH dated April 26, 2007.

Mr. Francis "Frank" Bianco was born on January 6, 1938 in Brooklyn, NY and died November 23, 2006. The purpose of my review was to assess Mr. Bianco's cumulative lifetime exposure dose in relation to the asbestos related disease being claimed with particular emphasis on exposures, if any, from products related to Weil-McLain.

### Brief Work History

As a teen (1950's) Mr. Francis Bianco reportedly worked as a helper and assisted his plumber father for Gifford Fuel Oil. Primarily this occurred on weekends or on days off of school. He estimated that he assisted his father 3 to 4 times.

Mr. Bianco attended Thomas Edison Vocational High School where he did his academic work in the morning and shop in the afternoon. He did hands-on work during 9<sup>th</sup>-12<sup>th</sup> grade at this vocational school. Welding, sheet metal work, plumbing, and heating were taught in the same shop.

At about age 16, Mr. Bianco reported working part time for 3 months for an unnamed upholstery shop. He performed general cleanup work and packed/made pillows.

According to the social security records he worked from the 4<sup>th</sup> Q of 1954 through the 1<sup>st</sup> Q of 1955 for Eric Peterson of Queens Village, NY; and in the 4<sup>th</sup> Q of 1956, from the 3<sup>rd</sup> Q through 1962. No further information is given.

Phone 847.692.4700 | Fax 847.692.3127 | 1300 Higgins Road, Suite 301, Park Ridge, IL 60068-5772 | [www.boelterassociates.com](http://www.boelterassociates.com)

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Boelter Associates

Mr. Cameron Turner

Re: Francis Bianco

In re: New York City Asbestos Litigation In-Extremis Trial Group

August 13, 2007

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From 1955 through 1959 (age 17), Mr. Bianco recalled that he joined and served in the United States Navy (the social security records show this service to be from 1957 and through 1958). Mr. Bianco served as a shipfitter and pipefitter fireman. He attended boot camp first in Bainbridge, MA for 6 weeks. He was trained as a shipfitter. He said a shipfitter's responsibilities were like a plumbers, repairing all kinds of pumps, fixtures, piping and valves. At boot camp he worked in the workshops and mock shop. Following boot camp he was transferred to the USS Intrepid. He served on the Intrepid as a shipfitter fireman from 1955 through 1957.

The USS Intrepid (CBA or CV11) was described as an attack carrier.<sup>1</sup> Mr. Bianco said fireman was his rank and shipfitter was his class. As a shipfitter fireman, he reportedly worked out of a shop located on the hanger deck on the starboard side. The hanger deck is located 1 deck below the flight deck. Mr. Bianco estimated there were 30 men in his group. This group was responsible for general maintenance and repairs on valves, plumbing fixtures, and pumps. He said he and another man repaired the catapult because they were the smallest and could fit inside. The catapults launched the planes and were powered by steam. He said there was a series of four tanks, and one tank had a leak in it, and they had to go in and paint "stuff on the inside to kind of show the leak on the outside, so it could be repaired." His duties included standing watch.

After leaving the Intrepid in 1957 Mr. Bianco was transferred to Orange, Texas where he served until 1959. He reported performing repairs on "mothball" ships. These were ships taken out of commission however they still needed repairs and upkeep. Mr. Bianco estimated he worked on a couple dozen ships during the 2 years in Orange but he could not recall any names. He reported performing the same types of work as he had on the Intrepid with the addition of welding work and building trailers. There was a weld shop where he did most of his welding work. Mr. Bianco identified performing heliarc and oxyacetylene welding.

The interrogatory responses report during his service period, Mr. Bianco spent time at the Brooklyn Navy Yard.

Upon his return to civilian life in 1959 Mr. Bianco worked for 1 month as a plumber for an unnamed employer in Queens, NY. This may coincide with the social security report of his working during the 1<sup>st</sup> Q of 1959 for Alert Plumbing & Heating Co., Albans, NY. Mr. Bianco recalled it was just he and an older man. Mr. Bianco reportedly would get to the office at 8am and sit with the secretary and wait for his boss. The boss showed up at 9am, and fell asleep at this desk for about 1 hour. Then the older gentleman and Mr.

<sup>1</sup> CV11, Essex class aircraft carrier, launched 26 April 1943, by Newport News Shipbuilding & Dry Dock Co., Newport News, Va. (<http://www.navy.mil/navsource.org/archives/02/11.htm>) Reclassified CVA-11 in October 1952 and was the first American carrier to launch aircraft with steam catapults. In October 1954 she went into full commission as a unit of the US Atlantic Fleet. ([www.wikipedia.org](http://www.wikipedia.org))

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Bianco would go to the supply house for an hour, then spend 1 hour on whatever job they had to do before going to lunch.

During the 1<sup>st</sup> Q of 1959, the records report Mr. Bianco was employed at Giffords Lane Inc., Elmont, NY. No further information is provided.

From the 1<sup>st</sup> through 3<sup>rd</sup> Q of 1959, Mr. Bianco was employed at Waszak Plumbing & Heating, Long Beach, NY. Mr. Bianco said he worked for Waszak as a plumber in the early to mid 1960s for about 2 years. There were 4 people employed here and he recalled the company did home renovation primarily located in Long Beach. He estimated 95% to 97% of the sites were residential. Mr. Bianco reported that he performed "Basically, the same as I always did" in terms of work, including repair work, boiler work, installing fixtures, and removing fixtures.

Beginning in 1959 (3<sup>rd</sup> Q) and through 1965 (2<sup>nd</sup> Q) Mr. Bianco worked as a journeyman plumber for Argo Plumbing & Heating Corp., Franklin Square, NY. He recalled this employment occurring from 1962 through 1965. He estimated that 6 people worked here, and the business was owned by Edward Krepps. Mr. Bianco recalled that sometimes worked with a partner named Eddie Batx. He said Argo performed basically the same type of residential plumbing, and some light commercial work, just like Waszak. Here Mr. Bianco was a plumber performing repair work, new insulation work, and boiler work but stated, "Only basic jobs, whatever fell under the job description." Mr. Bianco reported that his new installation work included, like he had at Waszak, rough piping, sinks, toilets, tubs, and things. Mr. Bianco recalled repairing boilers, replacing plumbing fixtures if they needed repair, faucets, and all general plumbing work. "Everything that was broke we fixed." Mr. Bianco reported attending a couple BOCES classes.

During this same time period Mr. Bianco's social security records report employment at GL Lane Corp., Elmont, NY (1960, 4<sup>th</sup> Q; 1962 4<sup>th</sup> Q-1963 3<sup>rd</sup> Q); and Knut & Unni Enterprises Inc., aka Chicken Fryd, Queens Village, NY (1965, 1<sup>st</sup> Q). No further information was provided.

In the 2<sup>nd</sup> Q of 1965 and through the 3<sup>rd</sup> Q of 1967 the records report Mr. Bianco working as a journeyman plumber for Frank V. Panzarino, Inc., Uniondale, NY. Mr. Bianco recalled this employment occurring between 1965 and 1975. He recalled at Panzarino after Argo and that he remained here until he went into the truck driving business around 1974 or 1975. Panzarino had about 6 employees and Mr. Bianco reported generally working with a partner named Carmine. Mr. Bianco started as Carmine's helper and the two went out on jobs as a team but as he was classified as a journeyman by this time he also went out on his own jobs. Mr. Bianco reported that the plumbing work was as he had done for previous employers. This was primarily residential with a little light commercial. The light commercial work was basically the same as the residential work. He did general plumbing, boiler installation, fixture installation, roughing in new bathrooms and kitchens. "All the jobs were basically a repeat of one another."

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According to his social security records Mr. Bianco worked for Giffords Petroleum Inc., Island Park, NY (1967, 4<sup>th</sup> Q-1968, 1<sup>st</sup> Q); for Commander Oil Corp., Plainview, NY (1968-1971, 2<sup>nd</sup> Q; 1971, 3<sup>rd</sup> Q); Kepe Building Services Corporation, Syosset, NY (1968, 2<sup>nd</sup> Q); Giffords Services Corporation, Central Islip, NY (1970, 2<sup>nd</sup> Q-1971, 1<sup>st</sup> Q); and Giffords Chemicals Ltd., Central Islip, NY (1971, 1<sup>st</sup>-2<sup>nd</sup>). No further information was provided.

Mr. Bianco recalled working as a truck driver for 2 years in the early 1970s for Gifford Oil, Wyandanch, NY. He was a full time driver delivering fuel from terminal to terminal. Gifford had 10 employees. Mr. Bianco never performed any automotive or mechanical repairs but reported being in the shop where others were working on trucks. He worked around others working on mechanical equipment and performing general maintenance on the 2 pumping stations. The pumping stations were side by side in the rear of the building near the yard. The pumping stations were used to fill up the oil tanks, both below ground tanks and above ground tanks.

Next from the 2<sup>nd</sup> Q of 1971 through the 3<sup>rd</sup> Q of 1976 Mr. Bianco worked for C. Broman Transportation Corp and from the 2<sup>nd</sup> through the 3<sup>rd</sup> Q of 1974 he worked for Clifford Broman & Sons, Inc. The social security records show both entities were at the same address in W. Babylon, NY. He reported working as a truck driver for Broman from 1972 or 1973 through 1975. Broman had about 50 employees. Mr. Bianco described Broman as strictly a trucking company that transported mostly sand and gravel that was picked up at a plant in Melville and Babylon. Mr. Bianco reportedly was present multiple times a day when the sand and gravel was dumped into his truck. He was not responsible for dumping the aggregate into his truck; dumping it out was automatic. Occasionally he had to scrape the sand off the back of the truck with a shovel.

The social security records report Mr. Bianco employed at Balport Construction Co DIP, Hawthorne, NY (1973, 1<sup>st</sup> & 3<sup>rd</sup> Q, and 1975, 1<sup>st</sup>-2<sup>nd</sup> Q); Azzil Trucking Co Inc, Hicksville, NY (1973, 1<sup>st</sup> & 3<sup>rd</sup> Q, and 1975, 1<sup>st</sup>-2<sup>nd</sup> Q); JD Posillico Inc., Farmingdale, NY (1974, 3<sup>rd</sup> Q); Whitman Nurseries Inc., Jamesport, NY (1974, 4<sup>th</sup> Q); and Violara Corp, Elmsford, NY (1975, 1<sup>st</sup>-2<sup>nd</sup> Q. During an unnamed period Mr. Bianco reported working as a truck driver for Massapequa Fuel, Massapequa, NY. No further information is provided.

From the 4<sup>th</sup> Q of 1976 through the 3<sup>rd</sup> Q of 1980 Mr. Bianco was a co-owner of Kirsch's Inc., Massapequa, NY. He reportedly left the truck driving business when he married into the restaurant business. Kirsch's was described as a confectionary and restaurant. He reported working here fulltime from 1975 through 1978. Mr. Bianco reported responsibility for just about anything from cooking on the grill, to waiting on customers, to paying the bills. The restaurant was sold in 1978.

Mr. Bianco reported working for an unnamed employer in Hicksville, NY as a plumber from 1978 to 1980. After the restaurant was sold he returned to the plumbing field for a couple of years. He worked full time for a company whose name he cannot recall. He said there was a warehouse and 4 employees. Mr. Bianco recalled this company did pretty

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much the same residential plumbing and some light commercial work as his previous employers. At commercial sites he recalled others working on different types of machinery "with asbestos in it. I believe they were big air conditioning units at the time, that's about it."

Part time for about 1 year (1978-1979) Mr. Bianco reported owning and operating Park Hill Plumbing. He did not hold a plumbing license but Mr. Bianco reported doing small, minor repair business on the side.

In 1980 Kirsch's was repurchased and Mr. Bianco worked from 1986 through 1993 for Kirsch's Confectionary, Massapequa, NY. He reported this employment as 1980-1993. Mr. Bianco was the owner and operator with the same responsibilities he had the first time he worked at the restaurant. He said he repaired faucets "and light plumbing stuff".

After he sold the in 1993, for 5 years until 1998, Mr. Bianco worked as a truck driver for Huntington Wholesale Stationary. He loaded and delivered stationary supplies.

From 1998 to 2000, Mr. Bianco reported returning to plumbing when he worked for Salvatore-Grace Corp, aka New-Comfort Systems, Massapequa, NY. He was then laid off. New Comfort did all types of plumbing but Mr. Bianco said they specialized in radiant flooring heat. He reportedly performed hands-on work running the tubing in the ground or stapling it down to the hardwood floor so the radiant heat could come through the floor.

From 2002 through 2005 Mr. Bianco worked as a school bus driver for Educational Bus Transportation Inc, Copiague, NY. He claims he left this employment due to his illness.

According to the social security records Mr. Bianco collected income from MFC Mechanical Corp, Massapequa, NY from 1980 - 1990; the Benevolent & Protective Order of Elks of the USA, Massapequa, NY from 1980, 1982; Long Island Airports Limousine Service Corp, Hauppauge, NY in 1981; Lapeer Contracting Co Inc, New York, NY in 1982; Pacer Plumbing & Heating Inc, Northport, NY in 1982; Long Island Office Supply, Sayville, NY from 1990-1991; Huntington Tobacco Co Inc., Huntington, NY from 1993-1998; PGC Holding Corp., Massapequa, NY from 1995-2000; Weyant Oil Services Inc; Oceanside, NY; 2000 - 2002; and Heavenly Power Distributors Inc; Selden, NY; 2002.

In addition to his work history outlined above Mr. Bianco has performed various home repair and remodeling projects. These include removing an existing boiler and the installation of a new boiler in about 1975 or 1976. He has also replaced heating radiators and baseboard heat in his home and installed windows.

Mr. Bianco was a member of the Teamster's local 282 from 1976 to 1980 and the Teamster's local 805 for an undefined period.

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**Medical History**

Mr. Francis Bianco was diagnosed with mesothelioma in June 2006 by Dr. Saha. The Plaintiff claims this disease resulted from exposure to asbestos.

Mr. Bianco has a medical history including coronary artery disease, diabetes Mellitus, peptic ulcer disease, peripheral vascular disease. His family medical history includes his father's death from emphysema at age 55, his mother's death at age 55 from various health problems.

He has a smoking history of smoking 1 to 2 ppd of Tareytons, Lucky Strikes, and Pall Malls cigarettes from age 15 through age 57. He reported quitting 3 times in the middle 1960s for 2 to 3 months each time. This equals about a 63 pack year smoking history. His current wife smoked from 1974 until the early 1980s. His first wife smoked during their marriage. His father and his daughter were smokers.

**Asbestos Exposure History**

Mr. Francis Bianco claims to have worked with and around:

- a. *Boilers:* ("H.P." Smith, H.O. Smith, Kewanee, H.B. Smith, Erie, Weil-McLain, A.O. Smith, Cleaver Brooks, American Standard, Burnham, Peerless, Superior, York, Axman Anderson) assisted his plumber father ripping out boilers; they installed after the rip out. Estimated he went on 3 to 4 boiler jobs. While attending Thomas Edison Vocational he performed plumbing work on boilers and other equipment. There were about a half dozen boilers in the shop. He tore them down and rebuilt them. One was a pancake boiler where the sections sit on top of each other, the rest were standup sections. Some were hot water heat, oil fed, cast iron, some were jacketed and some were covered with asbestos. Recalled boilers that were green and others that were blue. On boilers at school he took the burners out, took valves and pumps apart and put everything back together. Some boilers had tie rods. Removing a jacket which was attached with screws, nuts and bolts, took 30 to 45 minutes. During school he worked on boilers a couple times a week. At boot camp he was trained as a shipfitter which involves work on boilers. As a plumber he replaced boilers, primarily in residential sites. Boilers had to be broken down as they were too heavy to carry otherwise. He described boilers coming packaged or sealed up that involved some disassembly for hook up. Jacketed boilers had metal on the exterior and insulation on the inside. He removed some "monster boilers", some were big and round like a pancake. For Waszak he worked with sectional boilers that were mostly cast iron and oil fed. During the 2 years at Waszak he removed 2 boilers a month. The number of sections varied; he estimated the average was 4 sections. At Argo he estimated performing boiler repair work 1 to 2 times per month. On some of the older boilers he recalled changing the externally mounted coils, he estimated these took about 5 hours to change. For Panzarino he worked at residential sites performing more installations then repairs on boilers. He

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also reported installing boilers in some light commercial settings. For New-Comfort he removed existing boilers during the installation of radiant heat systems. At his home he removed an existing boiler and installed a new boiler in the mid 1970s. Estimated this project took 3 days and that they worked at it 4 hours a day. Later he estimated that excluding the piping work, just removing the boiler took 2-3 hours. Estimates he worked on boilers 100-200 times over his residential plumbing career. Gifford Fuel, Thomas Edison Vocational, US Navy, Waszak Plumbing, Argo Plumbing, Frank V. Panzarino, New-Comfort Systems, personal home)

- b. *Gaskets:* (Garlock) as a teen he removed and installed gaskets between sections on boilers on 3 to 4 jobs with his father. During break downs of boilers he encountered gaskets. He described working with both pre-cut gaskets and gaskets he fabricated himself from sheet material. He reported working with gaskets in connection with his pump repair work and on valves. On some boilers he removed flange gaskets where piping came into the coils. (Gifford Fuel, Thomas Edison Vocational, Waszak Plumbing, Argo Plumbing, Frank Panzarino, personal home)
- c. *Insulating Cement:* used insulating cement he mixed by hand in a bucket with water on joints of pipe insulation. Described mixing a "loose asbestos", that came in 25 or 50lbs brown bags, with water to cover "valves and stuff on the outside of the boiler". On his home he described using this product on the smoke pipe going to the chimney and on piping. He estimated it took about 15 to 30 minutes to break this material apart. (Gifford Fuel, Argo Plumbing, Frank Panzarino, personal home)
- d. *Insulation:* during boot camp training he removed and installed pipe insulation, half round. Some of the pumps he worked with during boot camp were insulated. Onboard the Intrepid insulated pipes ran throughout and he was responsible for some pipe work including removing and replacing pipe insulation. On average he estimated performing onboard pipe work involving disturbance of insulation 1 to 2 times a week. During his plumbing career, he reported cutting half-round pipe insulation typically using a hacksaw. He removed pipe insulation, half round, from associated piping and insulation from the exterior of boilers. After the installation of boilers he reapplied insulation. At Thomas Edison he said jacketed boilers had insulation on the inside of the jackets but other boilers, the old cast-iron boilers, were "just wrapped with asbestos." During rip outs he used a hammer and chisel or other sharp tool to chop into the insulation to break it away from the boilers. He said insulation on the boilers was solid; it was a paste mixture that you covered the boiler with and it hardened. Depending on the size of the boiler he estimated it took about 1 hour to remove exterior insulation from boilers. In boiler fire chambers, he poured bags of micropellets between the boiler and the chamber. Reported that most steam pipe was insulated and overhead. He described removing the clips on the half round and breaking it apart, it would drop on the floor. After removing old pipe insulation he swept up the debris and put it in a bag. During rough-in plumbing work in kitchens and bathroom there were certain areas that had insulation in the walls that he took out to work. He described this insulation as powdery, fluffy insulation sometimes with paper backing. On some A/C units, he recalled exterior insulation; he did not see this material removed or installed. On his home boiler he recalled during removal the insulation inside the jacket was gray

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with a gritty, fine texture. There was a loose material in between the chamber and the boiler walls, he thought this looked like the fiberglass of today. (US Navy, Gifford Fuel, Thomas Edison Vocational, Waszak Plumbing, Argo Plumbing, Frank Panzarino, personal home)

- e. *Packing/Rope Packing*: (Garlock) removed and installed pump and valve packing. Used rope packing between sections. Packing was grayish 1" in diameter and could be 4' to 5' long. (Gifford Fuel, Thomas Edison Vocational, Waszak Plumbing)
- f. *Pipes*: at boot camp he worked on piping both in the workshops and mock shop. Onboard the Intrepid his main responsibility was piping throughout the ship. Recalls insulated piping throughout. On average he worked with pipe 1 to 2 times per week. During boiler work and plumbing work, he worked with pipe including steam pipe. (US Navy, Argo Plumbing, Frank Panzarino, personal home)
- g. *Pumps*: (Gould, Bell & Gossett, Warren, Buffalo) as a student, did repairs in the shop, he ripped them down and rebuilt them. Recalled the school shop had ½ dozen pumps. At boot camp most of the pumps he worked on were water including saltwater. On the Intrepid he did general maintenance on and repaired pumps; these were smaller pumps. While working on mothballed ships in Orange, TX for the Navy he repaired pumps that dealt with the intake of seawater. (Thomas Edison Vocational, US Navy, Waszak Plumbing, Argo Plumbing, Frank Panzarino)
- h. *Refractory/Refractory Brick*: on occasion he and his partner changed out fire boxes/chambers in boilers, cleaned the area and rebuilt them. Some fire boxes/chambers required building, others came pre-fabbed. At his home he and a friend removed the firebox/chamber and it took about 30 minutes. (Waszak Plumbing, Frank Panzarino, personal home)
- i. *Turbines*: did not work on turbines but was around them in the engine room when he served as a shipfitter on the Intrepid. (US Navy)
- j. *Valves*: (Jenkins, Fairbanks, Mansfield, Crane) as a teen he assisted his father changing out about 12 valves in total. This entailed breaking down and removing the old valve and installing a new valve and packing it. At school he worked on valves and pumps associated with boilers. At boot camp he was trained on valves. During general maintenance onboard the Intrepid he repaired and replaced valves. During his work on the mothballed ships in Orange, he worked on pumps and valves involving the intake of seawater. These valves were below water level and could not leak. Some valves were made mostly of brass. "You had a section that came apart or the valve would separate itself, and there would be a gasket in there, and there would be the stem of the valve, which would have another packing ring, which would also have a gasket in there." There were small valves about ½" and large valves 2". They were either gate or globe valves. (Gifford Fuel, Thomas Edison Vocational, US Navy, Waszak Plumbing, Argo Plumbing, Frank Panzarino)

#### Factors to be Considered in Risk Assessment

The epidemiological studies that have been performed that have established an association between mesothelioma and asbestos have also established that there are four (4) significant factors to be considered in the assessment of risk of mesothelioma. These four

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(4) factors are: latency (time between exposure and disease); fiber type (chrysotile or amphibole forms including crocidolite, amosite and tremolite); dose (intensity times duration of exposure); and personal susceptibility.

The latency factor is important in that the time between exposure and diagnosis of disease should be taken to the third or fourth power in calculating a particular exposure risk.<sup>2</sup>

The type of fiber is also important. It has been estimated that the exposure specific risk of mesothelioma from the three principal commercial types of asbestos is broadly in the ratio of 1:100:500 for chrysotile, amosite, and crocidolite respectively.<sup>3</sup> Cases of mesothelioma in individuals exposed only to chrysotile are extremely rare. Most such cases have been attributed to amphibole - tremolite - contamination of chrysotile.<sup>4</sup> Put somewhat differently, mesothelioma has been associated with exposure to amphibole asbestos - amosite, crocidolite, and tremolite - at low exposure doses, but with chrysotile either not at all or at extremely heavy doses. Current scientific consensus would indicate the amphibole forms are the causative agents in an asbestos related mesothelioma.<sup>5</sup>

As with all occupational exposure related diseases, there is a direct relationship between the dose and risk of contracting mesothelioma. That is, the number of cases among workers in heavily exposed trades, particularly those that include amphibole exposure (i.e. career insulators) is greater than those with the same type of fiber exposures but at lower doses (i.e. members of the construction trades). The lowest asbestos exposure doses that have been associated with mesothelioma in epidemiological studies are in the order of 4 to 5 fiber yr/cc.<sup>6,7,8</sup> Most individuals who develop asbestos-related mesothelioma are exposed to significantly higher doses.

<sup>2</sup> Peto, J., Seidman, Selikoff, *Mesothelioma Mortality in Asbestos Workers: Implications for Models of Carcinogens and Risk Assessment*, *Brit J Canc* 45:124-135 (1982).

<sup>3</sup> Hodgson, J.T. and Darnton, A.: *The Quantitative Risks of Mesothelioma and Lung Cancer in Relation to Asbestos Exposure*, *Ann Occup Hyg* 44(8): 565-601 (2000).

<sup>4</sup> Churg, A.: *Chrysotile, Tremolite, and Malignant Mesothelioma in Man*, *Chest*, 93(3):621-628 (1988).

<sup>5</sup> *Report on the Peer Consultation Workshop to Discuss a Proposed Protocol to Assess Asbestos-Related Risk*; *US Environmental Protection Agency, Office of Solid Waste and Emergency Response*; EPA 68-C-98-148 (2003).

<sup>6</sup> Ilgen, E. B. and K. Browne: *Asbestos-Related Mesothelioma: Evidence for a Threshold in Animals and Humans*, *Reg Tox Pharm* 13:116-132 (1991).

<sup>7</sup> *Sciences International, Inc.: Toxicological Profile for Asbestos*, Agency for Toxic Substances and Disease Registry; Public Health Service, US Department of Health and Human Services; Atlanta, GA (August 1995).

<sup>8</sup> Yarbrough, C.: *Chrysotile as a Cause of Mesothelioma: An Assessment Based on Epidemiology*, *Critical Rev. Tox* 36:165-187 (2006).

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**Analysis of Exposure****Total exposures**

Mr. Francis Bianco was likely exposed to some amounts of airborne asbestos for varying lengths of time. His years onboard Navy ships and in shipyards (1955-1959) would have likely been the period of his most significant exposures. Friable amphibole-containing insulation (amosite and/or crocidolite) materials would have been the likely source of Mr. Bianco's most significant exposures to airborne asbestos fibers.<sup>9,10,11,12,13,14,15,16,17,18,19</sup>

Additionally published studies of Navy exposure circa WWII show average daily asbestos concentrations ranging from 0.01mppcf to 0.8mppcf in General Room areas to 0.02mppcf

- <sup>9</sup> Fleischer, P. and Drinker, W.: A Health Survey of Pipe Covering Operations in Constructing Naval Vessels, A Report to the U.S. Maritime Commission, unpublished version September 1945, published *J Ind Hyg and Tox*, 28(1):9-16 (1946).
- <sup>10</sup> Marr, W.: Asbestos Exposure During Naval Vessel Overhaul, *Ind Hyg J*, pp.264-268 (1964).
- <sup>11</sup> Mangold, C.A., Beckett, B.B., Bessmer, D.J.: Asbestos Exposure and Control, *Industrial Hygiene Division, Medical Department, Puget Sound Naval Shipyard* (1970).
- <sup>12</sup> Harries, P.G.: A Comparison of Mass and Fibre Concentrations of Asbestos Dust in Shipyard Insulation Process *Ann Occup Hyg*, 14:235-240 (1971).
- <sup>13</sup> Harries, P.G.: Asbestos Dust Concentrations in Ship Repairing: A Practical Approach to Improving Hygiene In Naval Dockyards, *Ann Occup Hyg*, 14:241-254 (1971).
- <sup>14</sup> Jones, D.R.: Assessment of Asbestos Concentration on Marine Vessels: Maintenance and Repair, Technical Report for U.S. Department of Commerce, *Maritime Administration* (February 1981)
- <sup>15</sup> Selikoff, I.: Partnership for Prevention - The Insulation Industry Hygiene Research Program: *Industrial Medicine*, 39(4) (1970).
- <sup>16</sup> Muir, D.C.F.: Health hazards of Thermal Insulation Products *Ann. Occup. Hyg.* Vol. 19, pp. 139-145 (1976).
- <sup>17</sup> Nicholson, W.J., Perkel, G., Selikoff, I.J.: Occupational Exposure to Asbestos: Population at Risk and Projected Mortality - 1980-2030. *Am J Ind Med* 3(3):259-311 (1982).
- <sup>18</sup> Balzer, J. L.R., Cooper, W. C.: The Work Environment of Insulating Workers *Am Ind Hyg Assoc J* 29(3):222-227 (1968).
- <sup>19</sup> Mangold C., Clark K., Madl A., Paustenbach D: An Exposure Study of Bystanders and Workers During the Installation and Removal of Asbestos Gaskets and Packing, *J. Occ and Env Hygiene*. 3: 87-98 (2006)

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to 2.8mppcf On-Board Ships.<sup>20</sup> These mppcf values would convert to average daily asbestos fiber concentrations of 0.06/fcc to 4.8f/cc in General Room areas to 0.12/fcc to 17f/cc On-Board Ships based on the conversion from mppcf to f/cc as 1:6.<sup>21</sup> Others have also studied and reported on asbestos exposures in shipyards and on-board ships and determined that ripouts of insulation yield considerably high exposures.<sup>22,23,24,25,26</sup> Friable insulating materials were commonly made of a blend of different fiber types including amosite.

#### ***Exposures to Weil-McLain Products***

Many of the other exposures which Mr. Francis Bianco may have received would have been considerably less significant than those related to friable, amphibole (amosite or crocidolite) asbestos containing insulating materials and their residuals.

Mr. Bianco could not recall a specific site where he worked on a Weil-McLain boiler but recalled most sites were residential. From start to finish took 2 days, including the removal of the old boiler and installing a new Weil-McLain. The installation only took 1 day with at least 2 people working. The Weil-McLain boilers he recalled removing and replacing were about 4' high, 3'-4' wide, and 4'-5' deep. Later he stated about ripping out Weil-McLain boilers, "I know the Weil-McLain I took out of my house. I don't recall at Waszak, it's possible I did." He stated while he was at Argo and Panzarino, it was possible he ripped out Weil-McLain boilers, but he does not have a specific recollection. Regarding the boilers he removed, when asked if he could tell one boiler from any other Mr. Bianco stated he could not.

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- <sup>20</sup> Fleischer, P. and Drinker, W.: A Health Survey of Pipe Covering Operations in Constructing Naval Vessels, A Report to the U.S. Maritime Commission, unpublished version September 1945, published *J Ind Hyg and Tox*, 28(1):9-16 (1946).
- <sup>21</sup> Ayer, H., Lynch, Fanny: A Comparison of Impinger and Membrane Filter Techniques for Evaluating Air Samples in Asbestos Plants, *Ann NY Acad Sci*, 132:274-287 (1965).
- <sup>22</sup> Marr, W.: Asbestos Exposure During Naval Vessel Overhaul, *Ind Hyg J*, pp.264-268 (1964).
- <sup>23</sup> Mangold, C.A., Beckett, Bessmer: Asbestos Exposure and Control, *Industrial Hygiene Division, Medical Department, Puget Sound Naval Shipyard* (1970).
- <sup>24</sup> Harries, P.G.: A Comparison of Mass and Fibre Concentrations of Asbestos Dust in Shipyard Insulation Process *Ann Occup Hyg*, 14:235-240 (1971).
- <sup>25</sup> Harries, P.G.: Asbestos Dust Concentrations in Ship Repairing: A Practical Approach to Improving Hygiene In Naval Dockyards, *Ann Occup Hyg*, 14:241-254 (1971).
- <sup>26</sup> Jones, D.R.: Assessment of Asbestos Concentration on Marine Vessels: Maintenance and Repair, Technical Report for U.S. Department of Commerce, *Maritime Administration* (February 1981)

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His repairs of Weil-McLain boilers involved one instance where he fixed a cracked section, "which means you would have to go in and open, tear the boiler apart and remove the section of boiler that was cracked and replace it, which is almost like putting in a whole new boiler." Usually only 1 section was cracked and each residential boiler had 4 sections. It took 7-8 hrs to repair a cracked boiler section. He would stop for lunch. One section was about 4' high, 3'-4' wide, and 4"-5" thick. Used a hammer and chisel to break the sections apart. "Because sections were put together with tie rods, you would have to take the tie rods off and there were push nipples, what they call push nipples between each section of boiler, usually four. And you would have to get in there and separate them and get that apart. And then you would have to replace all that with a new section and draw it all back together and then continue putting all the parts back together on the boiler." To install a new Weil-McLain boiler he removed whatever the old boiler was and cleaned the area. Most of the time, Mr. Bianco broke down the new boiler to get it to fit right. It was rare he was able to just slide the boiler in and hook it up. He normally took the packaged boiler out of the crate and broke it in half and then had to reassemble everything.

The descriptions of boilers with which Mr. Bianco claims to have worked do not match Weil-McLain products. Weil-McLain manufactured boilers that were typically residential or small commercial boilers. Weil-McLain boilers were cast iron sectional or preassembled package boiler. Weil-McLain did not supply any asbestos-containing thermal insulation products with their boilers. In any event, the only potential material which contained asbestos (chrysotile) involving a product provided by Weil-McLain would have related to fluid sealing devices or systems sealed interior to the boiler.

From an industrial hygiene perspective, fluid sealing devices or systems (i.e. gasket, packing, rope and seals) installation/removal in general is not considered to be a hazardous activity and is not considered to be unreasonably dangerous. Even if Mr. Francis Bianco had worked with or had worked around others who were working with asbestos-containing fluid sealing devices, this would have resulted in non-detectable to very low level exposure.<sup>27,28</sup> Therefore, his exposure to Weil-McLain products would have been non-detectable or de minimis at best and would not have been substantial.

### Conclusions

Based on the above considerations from the vantage point as a certified industrial hygienist and licensed professional engineer, I conclude to a reasonable degree of scientific certainty that:

1. It is likely, Mr. Francis Bianco had significant exposure to airborne amphibole (amosite or crocidolite) asbestos fibers; and

<sup>27</sup> Studies performed by F. Boelter of fluid sealing systems involving Weil-McLain boilers.

<sup>28</sup> Boelter, F.W., Crawford, Podraza: Airborne Fiber Exposure Assessment of Dry Asbestos-Containing Gaskets and Packings Found in Intact Industrial and Maritime Fittings, *AIHA Journal*, 63(6):732-740 (2002).

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2. The exposure category most likely to have significantly increased Mr. Bianco's risk would have been friable amphibole (amosite or crocidolite) asbestos-containing insulation products such as those described by Mr. Bianco; and
3. Mr. Bianco's years onboard Navy ships and in shipyards (1955-1959) would have likely been the period of his most significant exposures; and
4. As business owners, Mr. Bianco would have had the obligation to know about the hazards of the products he was using and maintaining, to have provided a safe and healthful workplace, and to have assured the protection himself and his employees; and
5. Exposure (dose) from fluid sealing devices or systems would have been statistically insignificant and could not have significantly increased a risk for Mr. Bianco; and
6. It is likely Mr. Bianco never worked with a Weil-McLain product; and
7. Weil-McLain products could not have been a significant factor in any exposure Mr. Francis Bianco may have had through his lifetime.

Please let me know if you have any questions.

Very truly yours,



Frederick W. Boelter, CIH, PE

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